

AMENDMENTS TO THE CLAIMS

Claim 1. (Canceled)

Claim 2. (Currently Amended) A spread code assigning method, for use in a code spread radio communication system including a first radio transmission device provided with a transmitter for transmitting different first through Mth code spread transmission signals from each of M (M is an integer of 2 or more) transmission antennas, and a second radio transmission device provided with a receiver for receiving and demodulating the first through Mth code spread transmission signals through N (N is an integer of 1 or more) reception antennas, for assigning spread codes to each of the transmission antennas, comprising:

calculating a correlation value of each of the propagation paths between the transmission antennas and the reception antennas;

preferentially assigning, to the ith (i is an integer of 1 or more and M or less) transmission antenna having a propagation path of a correlation value exceeding a predetermined threshold value, only spread codes orthogonal to the spread codes of the jth (j is an integer of 1 or more and M or less, $i \neq j$) transmission antenna corresponding to the correlation value or spread codes having a small cross correlation value to spread codes of the jth (~~j is an integer of 1 or more and M or less, $i \neq j$)~~ transmission antenna corresponding to the correlation value, and

assigning, to a transmission antenna having no propagation path of a correlation value exceeding the threshold value, spread codes without considering orthogonality to spread codes in the other transmission antennas.

Claim 3. (Original) The spread code assigning method as claimed in claim 2, wherein spread codes having a small cross correlation value to the spread codes of the j th transmission antenna are spread codes orthogonal to the spread codes of the j th transmission antenna.

Claim 4. (Currently Amended) The spread code assigning method as claimed in claim 2 or 3, wherein a standard correlation value is calculated based on each of the correlation values of the propagation paths between the M transmission antennas and the N reception antennas, and in the case that ~~for~~of preset L threshold values of $x_0, x_1, \dots, x_{(L-1)}$ ($0 \leq x_0 \leq x_1 \leq \dots \leq x_{(L-1)} \leq 1$), the standard correlation value is x_p or more and below $x_{(p+1)}$ (p is an integer of 0 or more and $(L-1)$ or less), a code multiplex number for the transmission antenna corresponding to the standard correlation value is set to be $(L-p)$.

Claim 5. (Currently Amended) The spread code assigning method as claimed in ~~any one of~~claims 1 through claim 2 or 3, wherein a correlation value compared with the threshold value is a standard correlation value calculated based on a cross correlation value of each of the propagation paths between the M transmission antennas and the N reception antennas.

Claim 6. (Original) The spread code assigning method as claimed in claim 4, wherein the standard correlation value is the maximum value among the $(M-1) \times N$ correlation values obtained by calculating correlation values of a propagation path between the i th transmission antenna and the k th (k is an integer of 1 or more and N or less) reception antenna with propagation paths between the first, second, ..., $(i-1)$ th, $(i+1)$ th, ..., M th transmission antennas and the k th reception antenna for the entire reception antennas.

Claim 7. (Original) The spread code assigning method as claimed in claim 5, wherein the standard correlation value is the maximum value among the $(M-1) \times N$ correlation values obtained by calculating correlation values of a propagation path between the i th transmission antenna and the k th (k is an integer of 1 or more and N or less) reception antenna with propagation paths between the first, second, ..., $(i-1)$ th, $(i+1)$ th, ..., M th transmission antennas and the k th reception antenna for the entire reception antennas.

Claim 8. (Original) The spread code assigning method as claimed in claim 4, wherein the standard correlation value is an average value among the $(M-1) \times N$ correlation values obtained by calculating correlation values of a propagation path between the i th transmission antenna and the k th (k is an integer of 1 or more and N or less) reception antenna with propagation paths between the first, second, ..., $(i-1)$ th, $(i+1)$ th, ..., M th transmission antennas and the k th reception antenna for the entire reception antennas.

Claim 9. (Original) The spread code assigning method as claimed in claim 5, wherein the standard correlation value is an average value among the $(M-1) \times N$ correlation values obtained by calculating correlation values of a propagation path between the i th transmission antenna and the k th (k is an integer of 1 or more and N or less) reception antenna with propagation paths between the first, second, ..., $(i-1)$ th, $(i+1)$ th, ..., M th transmission antennas and the k th reception antenna for the entire reception antennas.

Claim 10. (Currently Amended) A spread code assigning method, for use in a code spread radio communication system including a first radio transmission device provided with a

transmitter for transmitting different first through Mth code spread transmission signals from each of M (M is an integer of 2 or more) transmission antennas, and a second radio transmission device provided with a receiver for receiving and demodulating the first through Mth code spread transmission signals through N (N is an integer of 1 or more) reception antennas, for assigning spread codes to each of the transmission antennas comprising:

- detecting a reception quality at a time when
- each of said code spread transmission signals is received;
- reducing, in the case that the detected reception quality is below an object minimum value, a maximum value of number of the spread codes assigned to the transmission antenna corresponding to the reception quality, and
- increasing, in the case that the detected reception quality exceeds an object maximum value, the maximum value of the number of spread codes assigned to the transmission antenna corresponding to the reception quality.

Claim 11. (Currently Amended) The spread code assigning method as claimed in claim 10, wherein as the reception quality, any of a packet success rate, a signal to interference signal power ratio, ~~and~~ or a bit error rate is used.

Claim 12. (Original) The spread code assigning method as claimed in claim 10 or 11, wherein a priority order of assigned spread codes is set for each transmission antenna, and in the case that the maximum value of the number of the spread codes assigned to each transmission antenna is relatively small, different spread codes orthogonal to each other are assigned to each of the transmission antennas.

Claim 13. (Original) A code spread radio communication system including a first radio transmission device provided with a transmitter for transmitting different first through Mth code spread transmission signals from each of M (M is an integer of 2 or more) transmission antennas, and a second radio transmission device provided with a receiver for receiving and demodulating the first through Mth code spread transmission signals through N (N is an integer of 1 or more) reception antennas,

wherein the receiver is provided with a correlation value estimation unit for calculating a correlation value of each propagation path between each of the transmission antennas and each of the reception antennas and transmitting the calculated result as propagation path correlation information,

wherein the transmitter is provided with a spread code assigning unit, and

wherein the spread code assigning unit, based on the propagation path correlation information, assigns, to the ith (i is an integer of 1 or more and M or less) transmission antenna having a propagation path of a correlation value exceeding a predetermined threshold value, only spread codes orthogonal to the spread codes of the jth (j is an integer of 1 or more and M or less, $i \neq j$) transmission antenna corresponding to the correlation value, and assigns, to a transmission antenna having no propagation path of a correlation value exceeding the threshold value, spread codes without considering orthogonality to spread codes in the other transmission antennas.

Claim 14. (Original) The code spread radio communication system as claimed in claim 13, wherein the spread code assigning unit preferentially assigns, based on the propagation path correlation information, to the ith (i is an integer of 1 or more and M or less) transmission antenna having a propagation path of a correlation value exceeding a predetermined threshold

value, spread codes having a small cross correlation value to the spread codes of the j th (j is an integer of 1 or more and M or less, $i \neq j$) transmission antenna corresponding to the correlation value, and assigns, to a transmission antenna having no propagation path of a correlation value exceeding the threshold value, spread codes without considering orthogonality to spread codes in the other transmission antennas.

Claim 15. (Original) The code spread radio communication system as claimed in claim 14, wherein the spread codes having a small cross correlation value to the spread codes of the j th transmission antenna are spread codes orthogonal to the spread codes of the j th transmission antenna.

Claim 16. (Original) A code spread radio communication system including a first radio transmission device provided with a transmitter for transmitting different first through M th code spread transmission signals from each of M (M is an integer of 2 or more) transmission antennas, and a second radio transmission device provided with a receiver for receiving and demodulating the first through M th code spread transmission signals with N (N is an integer of 1 or more) reception antennas, wherein

the receiver is provided with a reception quality detection unit for detecting reception quality at a time when each of the code spread transmission signals is received and a code multiplex number control signal generating unit, the code multiplex number control signal generating unit, in the case that the reception quality is below an object minimum value, transmitting the code multiplex number control information indicating decreasing of the maximum value of the number of spread codes assigned to the transmission antenna

corresponding to the concerned reception quality, and also, in the case that the reception quality exceeds an object maximum value, transmitting the code multiplex number control information indicating increasing of the maximum value of the number of spread codes assigned to the transmission antenna corresponding to the concerned reception quality, and wherein

the transmitter is provided with a spread code assigning unit for assigning spread codes to each of the transmission antenna based on the code multiplex number control information.

Claim 17. (Currently Amended) The code spread radio communication system as claimed in claim 16, wherein the reception quality is any of a packet success rate, a signal to interference signal power ratio, and or a bit error rate.